

Introduction to CVPS Smart Grid Project:  
**CVPS SmartPower™**

May 19, 2010

2010 Renewable Energy Vermont

Distributed Generation Northeast Conference



**Central Vermont Public Service**

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# CV's continued focus on renewable energy

- Negotiated contracts for new energy supplies, much of it renewable
  - Includes power from a major wind project in New Hampshire
- Built Vermont's most publicly accessible solar array
  - With the help of Stafford Technical Center students, the International Brotherhood of Electrical Workers
- Cow Power program continues to thrive
  - Department of Energy's 2009 Utility Green Power Program of the Year
- Signed a preliminary agreement with Hydro-Quebec
  - Fills a substantial piece of our future energy needs at very competitive prices
- Will purchase Omya's Vermont Marble Power Division
  - Includes four hydro-electric facilities spread out along Otter Creek from Center Rutland to Middlebury



# Overview of “Smart Grid”

- Nationally:
  - Smart Grid is happening all around us
  - Federal Energy Policy Acts
  - Department of Energy stimulus funding
  - Many major utilities with Smart Grid initiatives
  - Blossoming Smart Grid industry
- Vermont:
  - Awarded over \$69 Million via a Department of Energy Smart Grid Investment Grant Award for projects totaling \$138 Million.
  - Vermont’s application was 1 of 100 awards granted nationwide. Over 400 applications were submitted.
  - CVPS has been awarded over \$32 Million to help fund the SmartPower project and reduce rate payer impacts for the cost of the SmartPower project.



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# What is Smart Grid?

**A Smart Grid uses technology to connect electric distribution facilities so that the entire system can be operated and managed more intelligently.**

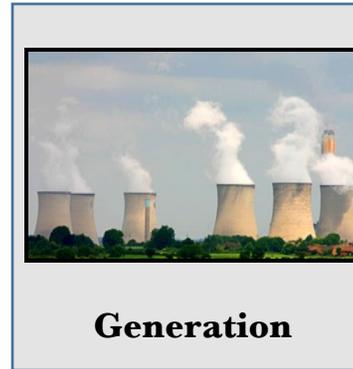
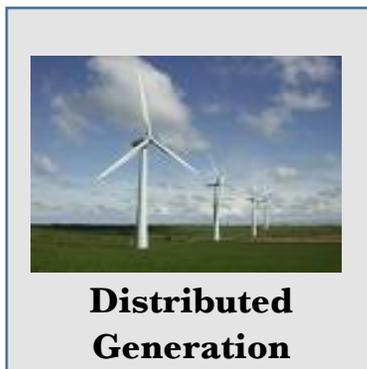


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# Many different technologies will be deployed to create a smart grid

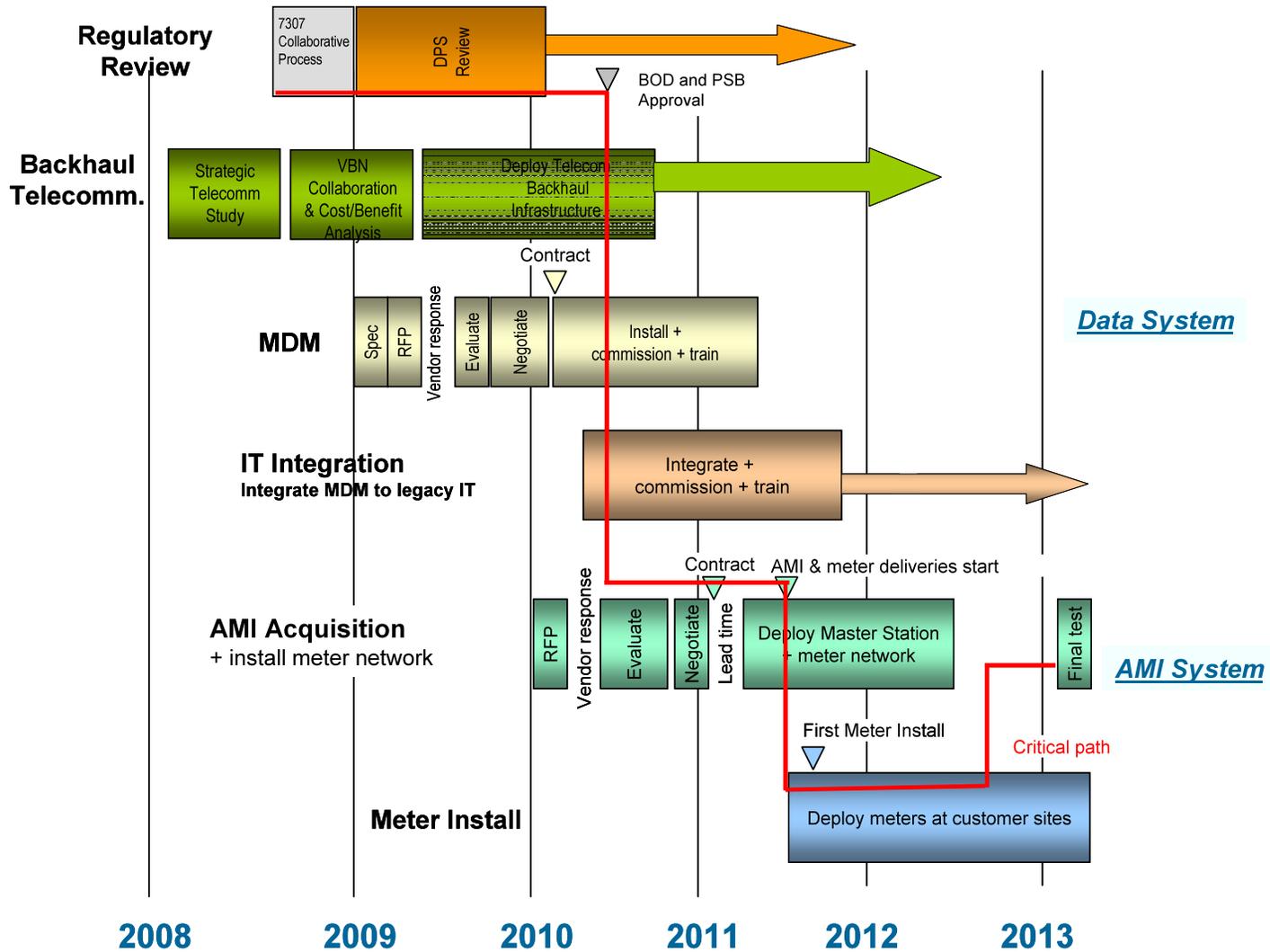


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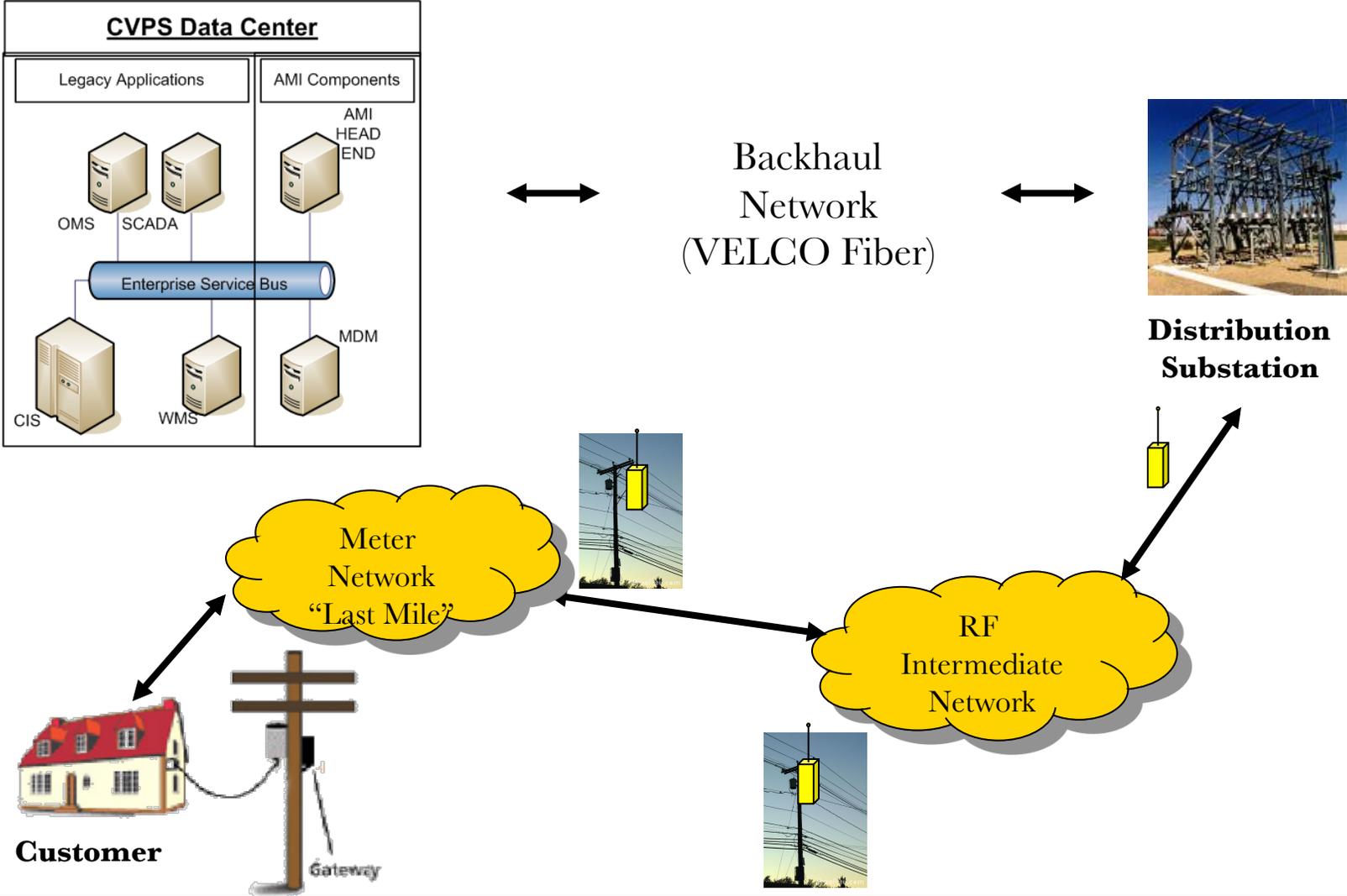
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# Technical Infrastructure Schedule



# Utility Office & Field System Conceptual View

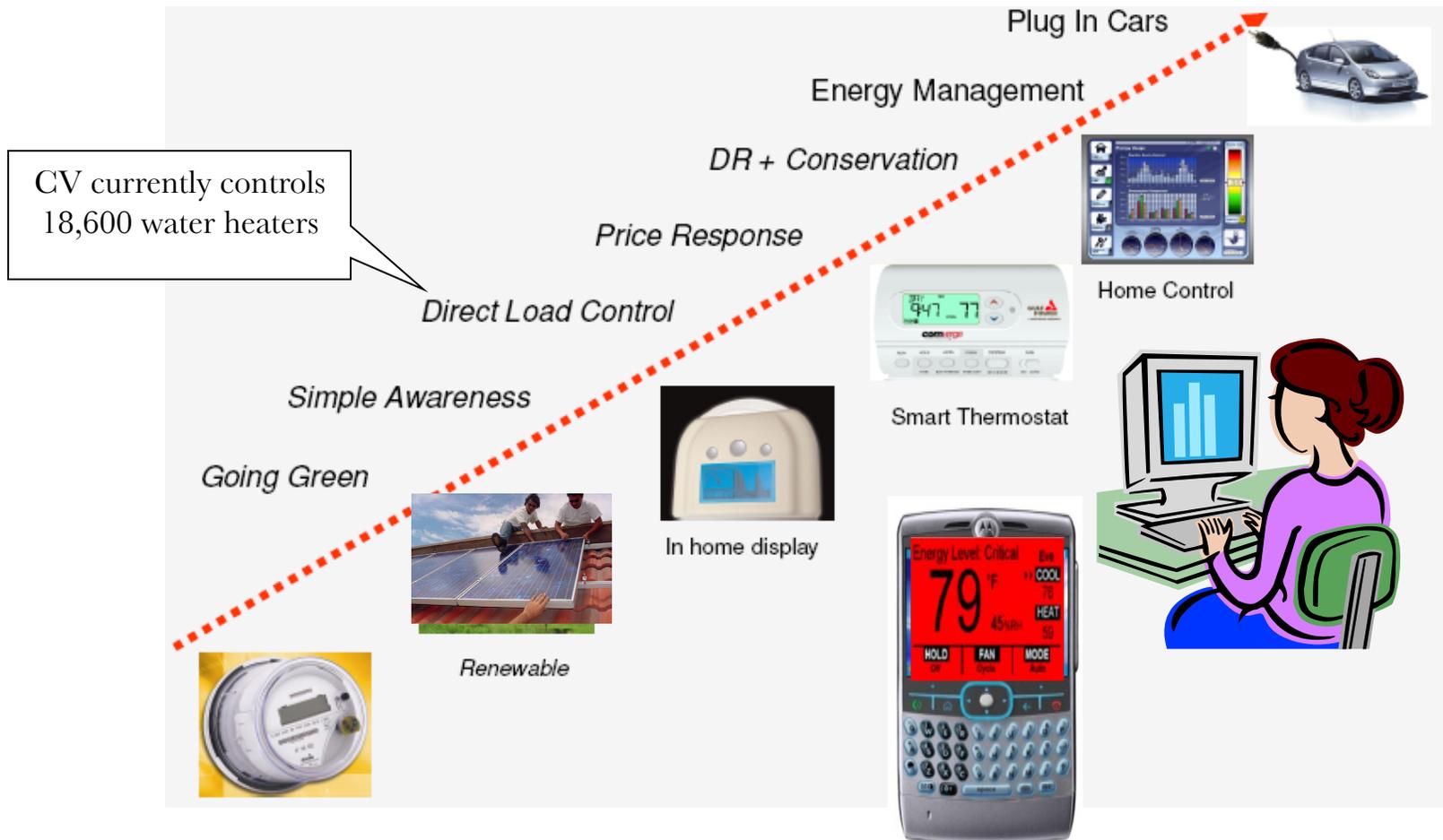


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# Customers **can** leverage technology and play a more active role in a smart grid

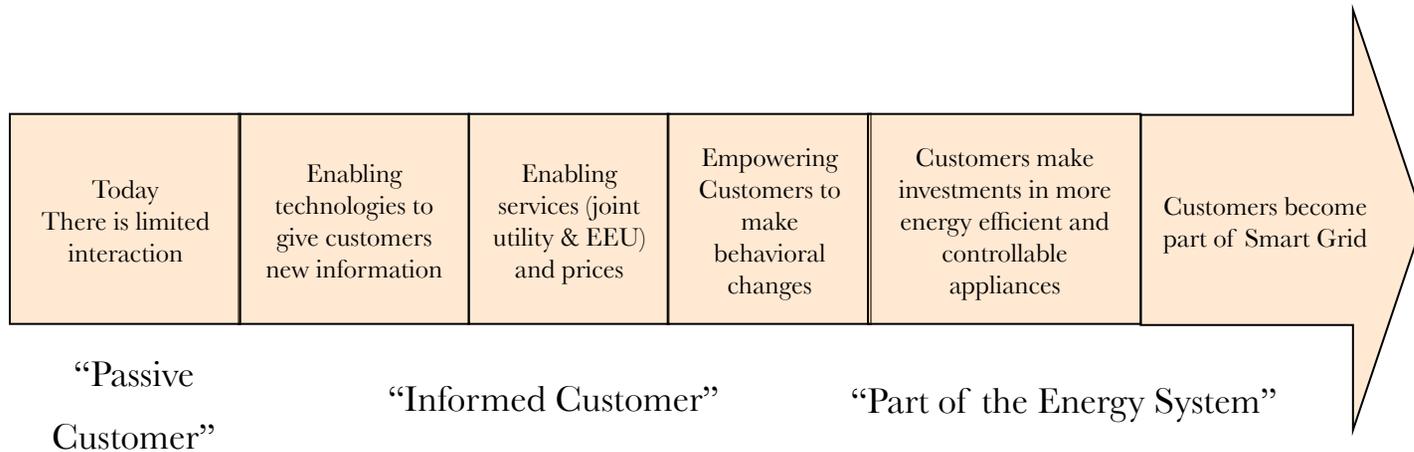


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# Customers' relationship with their utility is changing



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## Customer research & outreach is under way

- Market research to improve our understanding of customer awareness and expectations
- Customer service offering planning and evaluation
- Collaboration among the Vermont utilities on customer education and outreach is critical

***Today only 26% of CV customers are aware of the term “Smart Meter”. To achieve the benefits envisioned in the CVPS SmartPower™ program, customers need to use the technology.***



Ongoing education and engagement is key to facilitating customer acceptance and participation.



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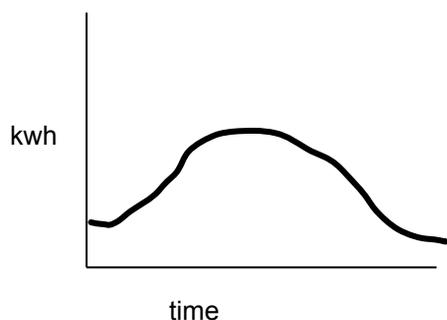
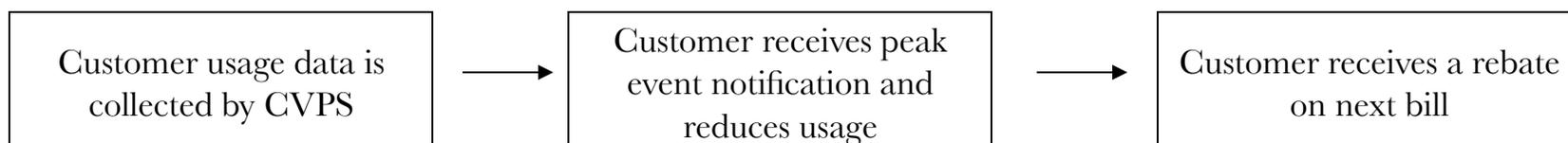
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# CV Currently has a Time-of-Use rate available to residential customers (Rate 9)

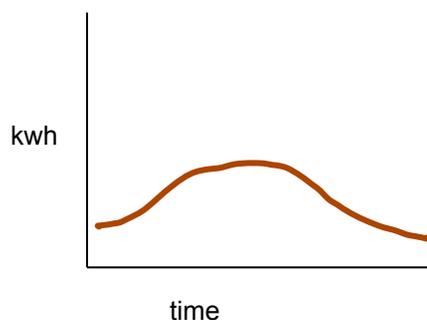
- This is an optional rate available to all private residences, individual apartments, and farms where all service is taken at one point through one meter. It is mandatory for very large accounts.
- Rate 9 is divided into three pricing periods that are designated as peak, intermediate, and off-peak hours.
  - Summer hours are shown to the right.
- Currently 76 customers have chosen or been assigned to Rate 9.
- CV will promote this rate when the new meters are installed and we're able to provide customers granular usage data and analytical tools.



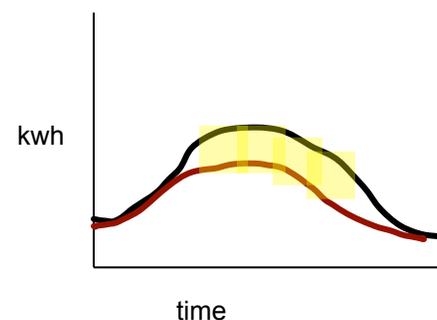
# New offerings such as Peak Time Rebate will provide customers with the ability to reduce costs



Comparison/regular day



peak event day

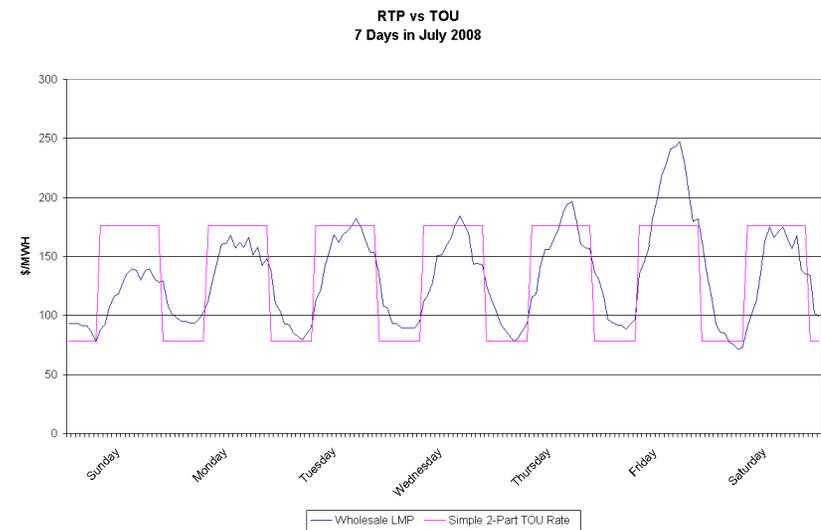


Rebate is difference between peak day and regular day usage



# Time-of-Use & Demand Response Programs link prices to wholesale markets

- Time of Use (TOU) rates combined with a Demand Response Program (e.g., a Peak Time Rebate (PTR) Program) reflect market costs throughout the year.
  - TOU rates reflect daily differences in wholesale energy costs.
  - PTR (or Critical Peak Pricing) events reflect capacity costs during system peak conditions.
- Over time, TOU rates can be expanded into more periods.
  - Off-peak hours can be modified to reflect “deep off peak” periods.
  - Ability to understand customers’ awareness and acceptance.
- In addition, the Company has committed to making a filing for a real-time price voluntary offering in October of 2011 for implementation in 2012.



Customers will be provided new information so they can make informed energy consumption choices



- Illustrative example of a customer-purchased in-home display (some rebates available)

- Illustrative example of customer web-presentation (100% of customers, next day)



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# Near Term Customer Benefits

- Provides the ability to better manage consumption and lower bills
  - Customers will have the ability to get information to better understand and control usage
  - Customers will have the choice to participate in energy efficiency, dynamic pricing and demand response programs to lower bills
  - Will help integrate home energy management networks
- Improves timeliness and accuracy of billing, fewer estimated bills
- Provides faster notification and restoration times from outages
- Offers remote service turn-on and shut-off
- Provides customer ability to call customer service for real-time meter read
- Gives customers the ability to participate in other pricing options
- Aids in customer side voltage problem resolution



# The role SmartGrid can play in renewable resource deployment

- Reduced costs for interval metering data collected continuously
- Load management/demand response could compensate for intermittent resource availability
- Robust load data and renewable resource output data could enhance forecasting techniques for load/generation dispatch
- Investment in stationary storage and plug-in vehicles could compensate for intermittent resources

